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# Myopericarditis in a teenager following first mRNA COVID vaccine dose: the role of multi-parametric cardiovascular magnetic resonance

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A 16-year-old male presented with severe, stabbing chest pain exacerbated by lying supine and relieved by sitting forward, associated with fever and myalgias 3 days after his first Pfizer-BioNTech SARS-CoV-2 mRNA vaccine. There was no haemodynamic compromise. Electrocardiography demonstrated ST-segment elevation in the inferolateral leads and PR segment depression, suggestive of pericarditis (*Panel A*). Troponin T levels were markedly elevated (peak 1165 ng/L; normal <14 ng/L). Echocardiography revealed mild left ventricular systolic dysfunction (ejection fraction 48%; *Videos 1* and *2*). Cardiovascular magnetic resonance (CMR) imaging performed 5 days later confirmed mild left ventricular systolic dysfunction (*Video 3*), with elevated myocardial T1 (1263 ms; normal 970–1050 ms, *Panel B*) and T2 (65 ms; normal 40–51 ms, *Panel C*) in the basal to mid-inferior and lateral segments, consistent with myocardial fibrosis and oedema, with corresponding sub-epicardial late gadolinium enhancement (*Panel D*) and increased extracellular volume (39%; normal <25%, *Panel E*). He was initiated on analgesia and guideline-based heart failure medications with 1.25 mg of bisoprolol 1.25 mg and 1.25 mg of ramipril daily. Cardiac monitoring for 72 h was uneventful. On discharge, he was pain free and troponin down-trending. The United Kingdom Medicines and Healthcare products Regulatory Agency was informed due to a suspicion of an adverse reaction to the vaccine. Given the relatively small clinical benefit of a second dose of vaccine for someone of his demographic compared with the potential risk of myocarditis recurrence, he has been advised against a further dose at this stage.

There have been increased reports of cases of myocarditis or pericarditis, although still thought to be rare, following mRNA COVID vaccination. Multi-parametric CMR was the key in confirming the diagnosis of myopericarditis. As vaccine programmes gradually target the younger age groups, who appear to be more susceptible to this potential reaction, pharmacovigilance will be key in estimating prevalence and provide more accurate risk vs. benefit information to the public.

**Consent:** The authors confirm that written consent for submission and publication of this case report, including images and associated text, was obtained from the patient in line with COPE guidance.

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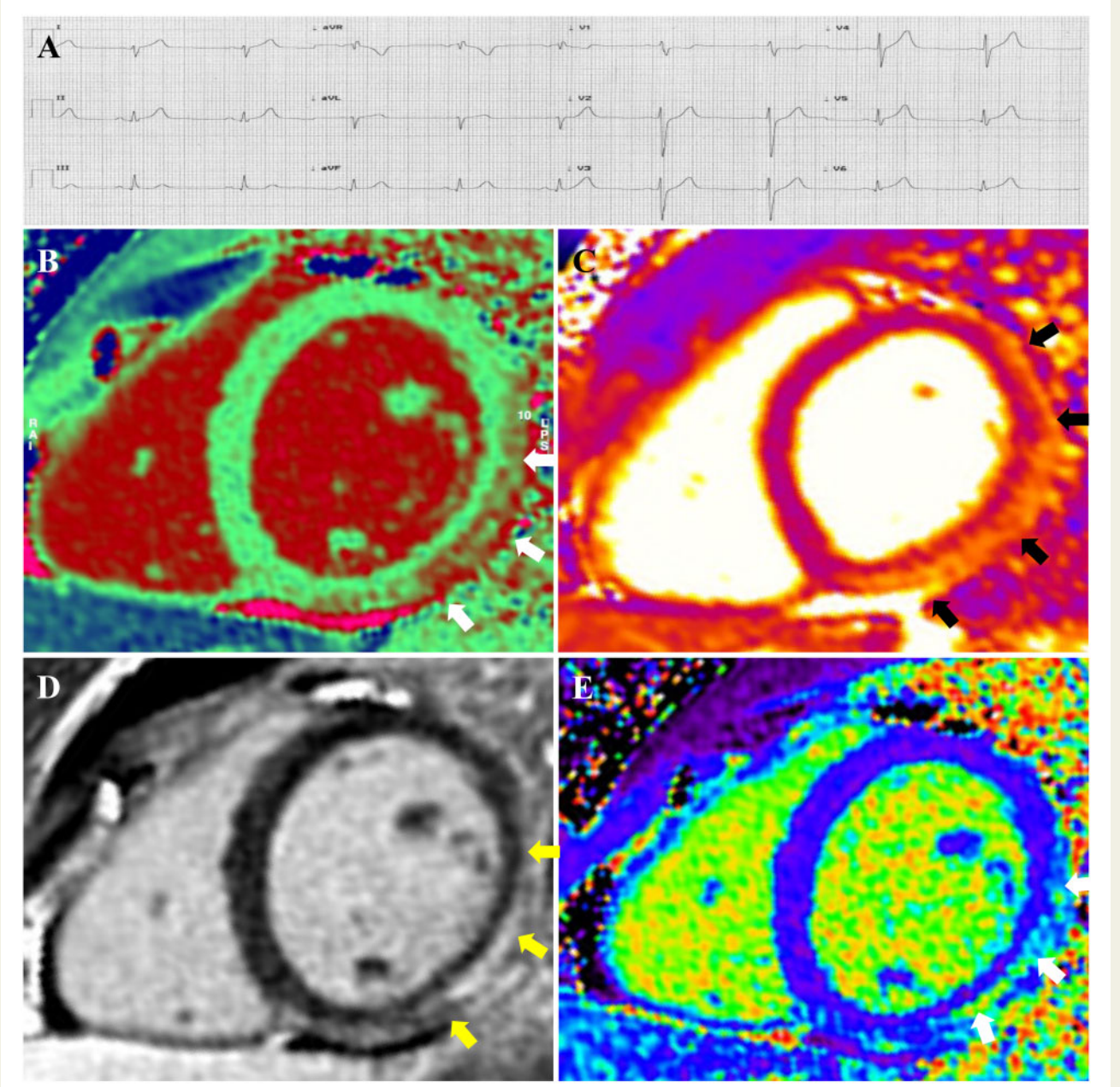


**Figure 1**